

10th ESLS RF meeting
27 September, Morning Session, 2nd part, Chairman Summary – T. Weis

Francis Pérez, “Status of the RF for ALBA”

The official start of the construction work at ALBA started July 27th this year. The RF-system for the booster and the storage ring is well under way. For the booster a 5-cell PETRA-type cavity is foreseen powered by one 80 kW IOT. The scheduled delivery (ACCEL) is 1/2007. Six HOM-damped cavities (“Dampy”) will provide the necessary voltage for the storage ring (3.6 MV). They are powered by two 80 kW IOTs each. The combination is done via a CaCo-system (resonator-line circuit combination), which allows a full combination of the RF power of two IOTs, but also operation under almost full performance in the case of one out of two IOTs is not working. An additional RF-transmitter will be built as an RF-test stand and as a spare. A total number of 14 transmitters has been awarded to Thomson, the first transmitter scheduled 5/2007 for tests, the others from mid 2008. The storage ring cavities (in total 7) have been already ordered (ACCEL). The design is based on the EU-type design which was developed and tested within an international collaboration. The ALBA cavities however are built with new HOM-dampers with in vacuum ferrites developed at BESSY. The first cavity is scheduled 1/2007 for RF-tests at ALBA. The analogue low level RF is designed and has been successfully tested. It will be implemented in the first years of operation of ALBA. To enhance the performance a digital low level RF is also under consideration.

Stefan Wilke, “Status of the PETRA III RF-reconstruction”

The PETRA storage ring at DESY, Hamburg now running mainly as the injector for HERA, will undergo major alterations to serve as a third generation light source (PETRA III) at 6 GeV in the near future. At present PETRA serves partly as a light source at 11.5 GeV and 50 mA beam. After reconstruction the RF-system provides an overall voltage of 20 MV at an energy loss per turn of 7.6 MV. The total power needed amounts to 1.6 MW at 100 mA beam current. 12 7-cell resonators are powered by four 800 kW klystrons. The distribution of the RF is done via hybrid couplers. The whole waveguide distribution will be altered. A new waveguide shutter is under development providing the possibility to shortcut the waveguide by implementing a shortening plate without “screwing” for enhanced flexibility. To allow the efficient use of the klystrons under various output power conditions a working point controller has been developed. Other activities concern the implementation of 8 longitudinal feedback kickers to fight coupled instabilities and a program to investigate the influence of radiation on electronics (ADCs, DACs, FPGAs) located near the accelerator and a crowbar system for klystron protection. A test stand for RF-windows has been established at DESY. The tests showed that a PETRA RF-window can stand 250 kW cw, a remarkable result.

Patrick Marchand, “Commissioning of the SOLEIL 352 MHz system”

Remarkable progress has been achieved concerning the commissioning of the SOLEIL facility as a whole but also of the complete RF-system. The booster RF was put into operation in July. Since then the 35 kW solid state amplifier operated without any RF-failure. Only a single module out of 147 has failed without influence on the

overall performance. For commissioning of the storage ring the first cryomodule containing two 352 MHz single cell resonators tested at the ESRF and reassembled at CERN is in place powered by two 180 kW solid state amplifiers. The second cryomodule and the remaining two 180 kW amplifiers will follow mid of 2007 to allow operation with all IDs at 500 mA and 4.4 MV overall voltage. The cryoplant installation was finished early 2006 followed by commissioning. The first part of the RF plant was built and tested at LURE and was then moved to SOLEIL end of 2005. 180 kW have been successfully achieved with both RF modules working on a load in April 2006. RF commissioning of the first cryomodule started in May 2006. Without beam the cavity was successfully commissioned with 80 kW full reflected power per cavity (sufficient for 200 mA). The modular RF-transmitters also for the storage ring showed a remarkable performance (40 failures out of 1500) without interruption of operation. Together with the booster RF the SOLEIL group has shown that the solid state amplifiers are a competitive solution. The second cryomodule is ordered from ACCEL. Cryogenic tests at CERN in a vertical cryostat are scheduled 10/2006. Concerning SOLEIL as a whole 300 mA has been stored in September 2006. 300 mA for users are scheduled beginning of 2007, the full 500 mA performance with cryomodule 2 and the additional transmitters end of 2007. Congratulations.